European Commission

101 Ideas

on the future of Research and Innovation in Europe

Research and Innovation

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European Commission
Directorate-General for Research and Innovation
Directorate A — Policy Development and Coordination
Unit A2 — Research and Innovation Strategy

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EUROPEAN COMMISSION

101 Ideas

on the future of Research and Innovation in Europe

Messages from RISE Tour d'Europe 2017-2018

2019 Directorate-General for Research and Innovation

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FOREWORD

In my foreword to the RISE group's report *Europe's Future: Open Innovation, Open Science, Open to the World* in 2017, I expressed my wish that it would foster a broad reflection throughout Europe on the economic and societal policy rationale for an open EU research and innovation strategy.

When I wrote those words, I could not have imagined the scope and depth of the discussions that would be sparked by the ensuing *Tour d'Europe* with the many Think Tanks and policy makers across Europe.

The diversity captured in this current publication is truly inspiring. It exemplifies the best of the European spirit to embrace difference, make room for every voice, and strive for a better future based on universal human values.

I am deeply grateful to the members of the Research, Innovation and Science Expert (RISE) group for their invaluable contribution to developing my policy agenda in both this and other contexts. I also express my gratitude to the many other experts and policy makers across Europe who took part in the *Tour d'Europe*. Your commitment to the future of European research and innovation, and indeed the future of the European project, is heartening.

I remain firmly convinced that research, innovation and openness are the foundations that will allow us to reach our full potential and build a better society for the generations to come. The ideas included here will play their part in building that future society.

CARLOS MOEDAS
European Commissioner for Research, Science and Innovation

EXECUTIVE SUMMARY

In his foreword to the 2017 RISE (Research Innovation and Science Experts) book *Europe's Future: Open Innovation, Open Science, Open to the World*[1], *Commissioner* Carlos Moedas encouraged readers to *'engage in a broad reflection and debate throughout Europe on the economic and societal policy rationale for an open EU Research and Innovation strategy'*.

The *Europe's Future* book was written at the request of Commissioner Moedas, as a collaborative effort by the members of the RISE Group, who represent a diversity of nationalities and backgrounds and a wide spectrum of expertise. The group was asked to reflect on the challenges of research and innovation policy, in an out-of-the-box fashion and to make concrete proposals for policy action where needed. The out-of-the-box nature of the reflections meant that the group did not strive to present a consensus view, but rather to represent a diversity of perspectives to inform and enlarge the debate about research and innovation and their contribution to Europe's long-term future.

The Research and Innovation *Tour d'Europe* grew out of the desire of the RISE group to take the discussion on the role of research and innovation in the future of Europe out of the 'Brussels Bubble' and to include their counterparts, research and innovation experts, advisors and policy makers, from the national and regional level.

The aim was both to spread the message to individual countries on the importance of the so-called 3 'O's – Open Science, Open Innovation and Open to the World – vision of Commissioner Moedas for European research and innovation and to gain insight on the thoughts and views in individual countries on Europe's future in research and innovation. Inspired by President Jean-Claude Juncker's initiative to have a wide and open reflection on the future direction of the European project[2], the *Tour d'Europe* focussed on where EU research and innovation policy should be heading and what could be its particular role in the wider policy debate about Europe's future.

All of the meetings that took place during *Tour d'Europe* followed a broadly similar agenda with most including the vision and values for the future of research and innovation in Europe, how to focus on impact and citizens, along with a variety of topics of particular interest to the hosts[3].

This brought forth a panoply of thoughts and ideas, reflecting a myriad of national perspectives and the individual histories of research and innovation in each country. New ideas emerged from distant corners of Europe, along with unique perspectives based on individual experiences of each country, showcasing both the diversity and the unity of Europe.

This current collection again does not strive for consensus. The structure reflects the structure of the open discussions that took place in each destination of the *Tour d'Europe* and does not claim to present a consensus view; rather it aims to display the depth and breadth of thinking around the future of research and innovation taking place around Europe.

The need for a vision for European research, science and innovation that is rooted in core European values and meaningful outcomes for citizens came through very strongly. Europe has a rich and deeply intertwined scientific and cultural heritage. Since the times of classical antiquity and throughout the Renaissance and Enlightenment periods right through to the present day, scientific excellence has been a core element of European strength and diplomacy.

Today, too often the vision for R&I is articulated only in dry numeric terms, comparing productivity levels, number of unicorn firms, share of scientific publications, number of patents, etc. with that of other leading jurisdictions in science and innovation, often drawing a negative conclusion about Europe. While such statistics are, and will remain, important indicators they are just that, indicators, and to focus too much on them is to risk losing sight of the bigger picture.

The most consistent and striking theme to arise was that of citizens and their relationship to European research and innovation. In a world where mistrust of science and expertise is growing, fed by populist movements, the need to bridge the divide that citizens feel between them and the scientific and political 'elite' was a recurring idea. This points to a need for better inclusion of citizens in the entire R&I policy process and to focus resources on delivering what Robert Schuman

referred to as *concrete achievements which first create a de facto solidarity*[4].

A repeated message was that the solutions to the complex 'wicked' problems that we face today will be systemic. It is no longer sufficient to focus efforts on making incremental improvements in individual sectors. Rather Europe must act to enact breakthrough or systemic changes in our approach in terms of consumption, production, mobility, healthcare, environmental protection, energy, international cooperation, and take a holistic approach that also considers the interactions between these and other policy areas.

In this context, many of the meetings saw R&I Missions and the European Innovation Council discussed as a means to help to enact such far-reaching changes in how Europe implements R&I policy. The need to support such new approaches with new measurement tools to capture progress towards the desired achievements also came through strongly.

Addressing the global climate crisis, improving health outcomes for the aging population in Europe, addressing (child) poverty, mitigating the migration crisis, ensuring that future waves of innovation lead to high quality jobs across Europe. To deliver on change of such magnitude requires a paradigm shift in how we develop crosscutting policies, how we regulate and how we fund. It will require a massive cultural shift in governance. Many of the interlocutors expressed that if we do not step up to shape the future, then the future will shape us, perhaps in ways antithetical to our core values.

Related to this, the need for ongoing harnessing of potential synergies was another recurring theme. Both in terms of the better need for synergies with other EU funding programmes, particularly Structural and Cohesion funds, Common Agricultural Policy, Invest EU etc. - but also in terms of policies. The need for R&I policy to support the aims of climate policy and health policy. The need for R&I policy to work with education and employment policy to secure high quality jobs for citizens. The need for European policy and funding to be aligned with national, regional, local and even global ambitions. This points to the need for a two-way relationship, where research and innovation inform wider policy ambitions and actions while at the same time R&I policy is developed with cognisance of the wider political and policy context of Europe.

In many countries, particularly but not only the smaller ones, the critical role of a strong, independent Europe on the world stage, able to multiply the efforts of Members States and project collective strength was emphasised. European research and innovation takes place in a vast ecosystem combining local and global, rural and urban with universities and cities as key actors. The role for EU level R&I policy is to build strong links between the various actors and institutions in this ecosystem and provide support so that continuing excellence in European science operates for the benefit of all.

All in all, this publication contains the symbolic number of 101 Ideas. It is structured in a collection of specific topics that will need to be addressed if European Research and Innovation is to realise the *concrete achievements* that Schuman proposed almost 70 years ago.

The *Tour d'Europe* provides the quality and legitimacy to inform and spur a transparent European debate. Taken together, these '101 Ideas' are intended to provide inspiration for the ongoing reflection on the role of research and innovation within the broader framework of Europe's 2030 policy.

This collection expresses the creative capacity of Europe to generate ideas for future policy building on the paradigm shift to openness, inspired by Commissioner Moedas at the beginning of his mandate.

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[1] https://publications.europa.eu/en/publication-detail/-/publication/527ea7ce-36fc-11e7-a08e-01aa75ed71a1

[2] https://ec.europa.eu/commission/future-europe_en

[3] See Annex 2 for a complete list of agenda topics. The full archive of agendas (and summaries) for each meeting is available here: https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/support-eu-research-and-innovation-policy-making/rise-group/research-and-innovation-in-europe_en

[4] https://europa.eu/european-union/about-eu/symbols/europe-day/schuman-declaration_en

TOUR D'EUROPE

EUROPEAN PARLIAMENT
27 June 2017

PARIS
7 September 2017

STOCKHOLM
12 September 2017

MADRID
6 October 2017

BERLIN
14 & 15 November 2017

HELSINKI
28 & 29 November 2017

WIEN | **VIENNA**
15 & 16 January 2018

TORINO | **TURIN**
25 January 2018

СÒФИЯ | **SOFIA**
29 January 2018

ΑΘΗΝΑ | **ATHENS**
12 February 2018

PORTO
16 February 2018

TALLINN
(covering Estonia, Latvia and Lithuania)
6 March 2018

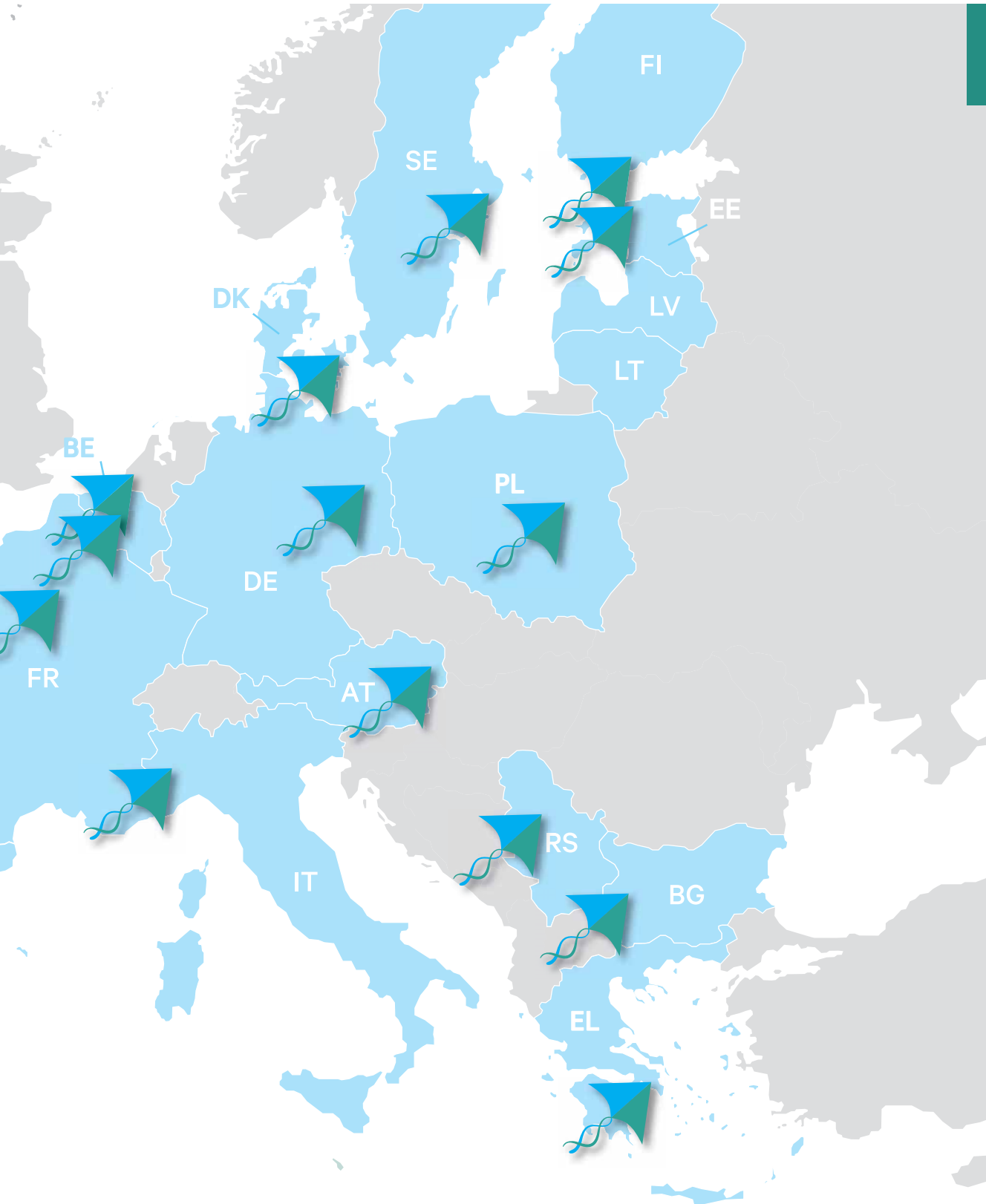
WARSZAWA | **WARSAW**
20 March 2018

BRUSSEL | **BRUXELLES** | **BRUSSELS**
22 March 2018

KØBENHAVN | **COPENHAGEN**
11 June 2018

БЕОГРАД | **BELGRADE**
3 July 2018

BAILE ÁTHA CLIATH | **DUBLIN**
29 & 30 August 2018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1|12 VISION

1. **THE NARRATIVE MUST CHANGE** (Berlin, Madrid, Paris, Stockholm, Warsaw)

   The current narrative around research and innovation rests mostly on economic growth and productivity gains. Broader European social values and citizens' needs should be at the heart of the new policy narrative. Innovation, and the economic benefits that flow from it, will follow. This is the only way to achieve sustainable wellbeing and concrete solutions for citizens.

2. **STOP COMPARING EUROPE TO THE US AND CHINA** (Helsinki, Madrid, Porto, Sofia)

   We need to move away from measuring our success by comparison with the US and China. Most Europeans do not want a society that resembles the US or China. Instead, we should gauge the impact of our efforts by looking at what Europe's new generations care about: what are their dreams and values? Europeans want a welfare state, an open society and a strong, cooperative and independent Europe that can represent them on the world stage. They want public investment to show tangible outcomes, benefitting all Europeans.

3. **BE INSPIRING ABOUT EUROPE: BUILD ON OUR STRENGTHS TO 'MAKE EUROPE MEET CHALLENGES'** (Copenhagen, Madrid, Stockholm, Warsaw)

   We need a more inspiring narrative of research and innovation in Europe. Research and innovation have been intrinsic to European culture and the construction of society since the times of classical antiquity. From the Renaissance through the Enlightenment, the history of science in Europe is a history of freedom and rebellion resting on an open exchange of ideas. Diversity is a richness and collaboration is our strength, underlying and reinforcing our capacity to think and invest in the long-term.

4. **BUILD A COLLECTIVE VISION BASED ON EUROPEAN DIVERSITY** (Athens, Madrid, Porto)

   Learn from the cradle of European civilisation: The future of Europe is a future where countries converge towards an increasingly sustainable society built on a knowledge-based economy and a values-based social democracy.

5. BRUSSELS (AND ROME) ARE TOO FAR AWAY: PLACE-BASED INNOVATION CAN BRING R&I CLOSER TO LOCAL NEEDS (Athens, Berlin, Dublin, Turin)

R&I should be closer to citizens and local communities. Working with and in cities, as well as regional and local communities, to manage implementation is the best way to be relevant for people in their everyday lives.

Cities are important hubs in the innovation chain but solutions developed in cities will not always work in other contexts. 'Place-based innovation' can turn Europe's diversity into an asset. This is particularly important for Southern European countries, trapped between low salaries and a low value added structural adjustment.

6. RECONCILE THE PAST, PRESENT AND FUTURE (Athens, Belgrade, Sofia, Warsaw)

Many R&I systems in Eastern Europe have undergone dramatic transformations but retain fundamental strengths. The science system in much of Eastern Europe retains excellent scientific expertise in many disciplines such as physics, material sciences, mechatronics, advanced computing, artificial intelligence and so on.

Future opportunities can grow from these accumulated strengths. These past strengths can be reconciled with future strengths to generate new forms of collaboration between the established scientific community and the new and young digital economy. Trust-building and systemic change are required.

7. A KNOWLEDGE-BASED SOCIETY FOR ALL (Madrid, Porto)

Two decades after the Lisbon Agenda was launched, several of the same challenges remain and many societal challenges have been aggravated; climate change, the aging population, the depletion of natural resources, poverty and increasing social inequality. Many people in Europe feel left aside, left outside the 'system'.

We need to better articulate the rationale for seeking a knowledge-based society, to reduce internal divergence in Europe and avoid one-way flows of resources and wealth from the periphery to the centre.

8. UNDERSTAND THAT GROWTH HAS A RATE, A DIRECTION AND A REACH (Dublin, Porto, Stockholm)

We have to realise that growth has not only a rate, but also a direction and a reach.

The effectiveness of research and innovation as drivers of economic growth is well established. We can be confident that by directing resources and efforts towards solving societal challenges, for example in the form of Missions, we will also enhance global competitiveness and market opportunities for European firms.

9. TAKE THE WORLD LEAD IN PRIORITY AREAS (European Parliament, Madrid, Paris)

There is a substantial opportunity for Europe to take the innovation lead on key global issues such as climate change. Allied with this, the EU can and should take the world lead in some science and technology areas. This requires bold choices, based on our vision, values, and strengths. Europe must build on its comparative strengths while positioning itself long-term in key enabling technologies and new markets. This requires flexibility of instruments and capacity for rapid response, such as the current global market opportunities for climate innovations, following the United States backing out.

10. FOCUS ON SUSTAINABLE DEVELOPMENT GOALS TO DELIVER MEANINGFUL SOLUTIONS TO CITIZENS (Berlin, Dublin, Helsinki, Madrid, Paris, Stockholm, Tallinn/Baltics, Turin, Vienna)

We need to build a European narrative on sustainability and translate the SDGs into a collective vision for Europe, a vision to engage citizens in Europe and confirm our open relationship with the rest of the world.

As one of the most successful transnational political initiatives that has ever existed, the European Union can lead on achieving the United Nations Agenda 2030 Sustainable Development Goals. These global societal challenges, collectively agreed on by 193 countries, align Member State and EU R&I policies with the global agenda, improving policy coherence and providing a mobilising vision citizens understand. Sustainable and inclusive growth should be the predominant goals of European research and innovation.

11. EXCELLENCE IN SCIENCE AND KNOWLEDGE CREATION IS A KEY OBJECTIVE FOR EUROPE (European Parliament, Helsinki, Madrid, Paris, Porto, Vienna, Warsaw)

After the Renaissance, Western Europe became the centre of the world. Knowledge grew in the Enlightenment and thereafter in the Industrial Age. We need to regain that spirit in our society. Europe should increase its funding for basic research, including but not limited to the European Research Council. Fundamental research is an essential component of the long-term strength of a civilisation.

12. BUILD GROWTH COMPANIES FOR QUALITY JOBS IN EUROPE (Helsinki, Madrid, Paris, Porto, Stockholm, Turin, Vienna)

Scaling-up innovative companies to generate growth and good jobs is a major objective for European research and innovation policy. We need to grasp the potential of the current transition from analogue to digital, from a linear to a circular economy and commercialise disruptive innovation. Combine R&I with social innovation and spur start-ups towards sustainable growth. Be open to systemic experimentation for innovation in the public and private sectors.

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EUROPEAN & UNIVERSAL VALUES

13. VISION AND VALUES GO HAND-IN-HAND (European Parliament, Paris, Tallinn/Baltics, Vienna)

The European project should provide a new vision for 2030, anchored in the established common values of peace, freedom, a better life for people and sustainability for our planet. This is where the interest of citizens, scientists, business, Member States and the EU coincide. Research and innovation provide real solutions to drive this vision and they should be top policy priorities.

14. BUILD ON EUROPEAN VALUES: OPENNESS, INCLUSIVENESS, DIVERSITY, AND SUSTAINABILITY (Copenhagen,Paris, Turin)

We must frame our research and innovation policies and funding within European values, such as openness, equality, cooperation, respect for diversity and the overall UN 2030 Agenda. The importance of European values becomes ever clearer in the global context. Research and innovation actions must combine excellence and leadership with inclusiveness, solidarity, global access to knowledge, cross-border cooperation and diffusion, acknowledging diversity. We must do this to ensure European independence, stability and resilience.

15. SHAPE THE FUTURE WE WANT; RATHER THAN LETTING THE FUTURE SHAPE US (Brussels, European Parliament, Madrid, Paris)

Technological development will increasingly influence our society and our lives. In the coming years, the fifth Industrial Revolution will emerge. The physical, digital, and biological worlds will blend, creating technologies with the potential to know more about us than we do ourselves. The controllers of these technologies and data will be powerful actors.

Europe must step up and give a direction to these technologies and their use and deployment, to shape the future. Otherwise, we risk that other research and innovation leaders, or private entities will shape our future society. To do this effectively, we will need more contributions from the 'forgotten' sciences: humanity and ethics.

16. RESPONSIBLE INNOVATION IS AS ESSENTIAL AS SCIENTIFIC INTEGRITY (Athens, Madrid, Porto, Vienna)

Just as scientific integrity is the foundation of progress in knowledge, responsible innovation is the foundation of progress in society. Principles of responsibility matter both in science and in innovation but they are currently only addressed in science. Yet, from a societal point of view, they are perhaps even more important in the context of innovation, because with innovation there is a risk that only a few will benefit, while society as a whole might suffer if innovation leads to processes of 'destructive creation' rather than creative destruction.

17. VALUE CANNOT BE MEASURED IN PURELY ECONOMIC TERMS (Berlin, Dublin, Paris)

When we measure value created and the return on investment in R&I we must use measures that take into account sustainable growth and providing concreate outcomes for citizens. This means looking at value in the broadest sense: encompassing economic concepts of value flows alongside other measures of value such as, meeting global challenges, improvements to quality of life, protection of the environment and better health outcomes.

18|29 CITIZENS

18. BRIDGE THE INCREASING GAP WITH EUROPE'S CITIZENS: BUILD TRUST AND PUT PEOPLE AT THE CENTRE (Berlin, Porto, Sofia, Stockholm, Turin)

There is an increasing gap between policy makers and citizens. Research and innovation are often perceived as benefiting an elite few with little or no relevance for citizens. Consider the limited media attention granted to research and innovation policy compared to other policies such as education, health or welfare, perceived as being much closer to the daily life of citizens. Citizens must be able to trust the knowledge system. Include them in all phases of the R&I process, from policy, to project and market: ask for their advice on what to do, and involve them in the implementation as well.

19. LISTEN TO THE CONCERNS OF CITIZENS (Athens, Berlin, Tallinn/Baltics, Warsaw)

Technologies serve those who develop them. Recent elections in some EU Member States show that citizens have lost their trust in establishment policies and politics. This trend may be reinforced in the next European Parliament elections. Mistrust in science and innovation is growing among citizens. Widespread dissemination of disinformation undermines the credibility of science. Aggressive marketing strategies and social media campaigning further erode trust.

20. CREATE A TWO-WAY DIALOGUE WITH CITIZENS (Athens, Berlin, Sofia, Tallinn/Baltics, Vienna, Warsaw)

We, researchers and experts, too often talk amongst ourselves and leave ourselves open to a perception of 'elitism'. At the same time, citizens' interests are underrepresented compared to other stakeholders in the negotiation of R&I agendas. In our communication, we need to engage with the intermediaries who interpret science for the public. A two-way dialogue between R&I and society will also reinforce the European R&I system.

21. CITIZENS FUND THE PUBLIC R&I BUDGET (Madrid, Sofia, Turin, Vienna)

A stronger and more proactive citizens' engagement is also essential to safeguard

budgets for R&I, because acceptance and ownership will be strengthened by the involvement and empowerment of citizens. If our aim – as Europeans - is to have a strong science and innovation system, it cannot be isolated, since an isolated system is always weak. If science should be a priority for public investment, we need European citizens to share scientific values and recognise the contribution of science to progress.

22. REINFORCE CITIZENS' CAPACITY TO ACT IN THE R&I PROCESS (Copenhagen, Dublin, Sofia, Tallinn, Turin, Vienna)

Citizens' involvement must be an informed involvement. Researchers should explain relevant science in an intelligible way and civil society should have a strong voice in priority setting.

We should mobilise a combination of existing communication channels: social innovation communities in cities and local communities, universities as platforms for evidence-based public discussion, schools and other educational institutions, direct discussions with experts from different sectors, civil society organisations representing the views of people both as individuals and as employees.

23. SPREAD THE BENEFITS TO SPREAD ACCEPTANCE (Berlin, European Parliament, Porto, Stockholm, Turin)

Technological advancement is driving rapid change but concentrating the benefits of innovation. Developments that seem only to benefit the few will not gain the trust of the many. If citizens are not involved then fear of change and rejection of innovation and science is logical. Expert-driven innovation may experience a backlash and become a focus of citizen protest.

Europe must take the lead in using R&I to sustain prosperity and quality of life for as many people as possible to help to gain meaningful results from new technology, spread the benefits of innovation and support the development of the knowledge and skills necessary to take advantage of technological advance.

24. WITHOUT TRUST, NOBODY WANTS CHANGE (Athens, Brussels, Madrid, Porto, Stockholm, Tallinn/Baltics, Turin, Vienna, Warsaw)

Many people are concerned about change and yet innovation is born in a culture of trust. We have to take a step back and reflect on why we invest in research and innovation. If citizens are involved in this reflection, then the trust in, and impact of, our investment will increase. Social science and the humanities can contribute to building understanding and trust.

25. FOCUS ON CONCRETE RESULTS IMPROVING LOCAL NEEDS (Dublin, Tallinn/Baltics, Vienna)

Frame R&I to what really matters for citizens, their daily local needs. Citizens can help to contextualise policy requirements, for example in Ireland concerns about emissions relate to cows rather than coal-fired power plants. European citizens should understand why we invest in research and innovation on their behalf. We must focus on outcomes from the very outset to ensure that public funding focuses on initiatives that bring benefit to citizens.

26. OPEN-UP TO THE 'RATATOUILLE EFFECT' (Porto, Tallinn/Baltics, Turin)

Not everyone can become a 'grand chef de cuisine' but a grand chef can come from anywhere. Empower people and talents. Innovation grows from creativity and entrepreneurial spirit. Every creative child and engaged elder makes society stronger. They are the genesis of our new Skypes and artists. However, many smaller or peripheral countries suffer brain drain: people are leaving.

27. CITIZENS ACQUIRE NEW ROLES IN THE KNOWLEDGE SOCIETY (Helsinki, Vienna)

More and more Europeans hold higher education degrees. Enabled by digitalisation and knowledge, citizens are today prosumers capable of shaping the innovation process and bypassing restrictive practices of established sectors and governments. This goes well beyond citizen science and covers the entire research and innovation process, with citizens becoming co-designers, co-creators and co-funders.

28. SHIFT FROM A RULE-BASED TO A PEOPLE-FOCUSED POLICY (Athens, European Parliament, Porto)

First, focus on people. Empower them as actors of change. Change and knowledge flow through people. Create a culture of 'knowledge-intensive entrepreneurship'. Without strong connections between policy makers, legislators, researchers, producers and innovators, who jointly design regulation to encourage creativity, new ideas and open space for new business models, there can be no success. The regulatory framework for R&I must be simplified and recognise that R&I requires risk taking and trust.

29. CREATE A SAFE DIGITAL 'PUBLIC SQUARE' FOR INFORMED DEBATE (Tallinn/Baltics, Vienna)

Today, we spend increasing time in the digital space, but it is not safe or secure and increased levels of disinformation (fake news) and targeted bot campaigns drown out genuine public debate. The attention economy has detrimental effects in this regard and undermines deep social learning. Much of the mediated public space is no longer as public or as representative as it should.

The future will increasingly involve merged physical and digital spaces. We need a clear vision for securing these spaces as places for inclusive, factual debate, backed up by appropriate technologies and systems.

30|35

OPENNESS

30. OPENNESS CAN BRING SCIENCE CLOSER TO SOCIETY (Athens, Copenhagen, Madrid, Porto, Sofia, Turin, Vienna)

Openness implies a deep change in the R&I environment. Openness is an approach to turn research and innovation into more inclusive activities, involving a much broader range of actors and stakeholders. Openness means aligning incentives and practices in the research and innovation system with democratic rights and values. This could mean anything from enhancing the democratic right to access publicly funded knowledge to developing freely available tools to improve collaboration, transparency or integrity.

31. OPENNESS IS BETTER WHEN IT WORKS BOTH WAYS (Helsinki, Tallinn/Baltics)

For small countries, openness and collaboration across borders is essential. It is an issue of survival. In this interconnected world, we need to think and act globally. However, when partners sometimes think 'US-first' or 'China-first', smaller countries can find it challenging to push for reciprocal openness. The EU has the weight to push for this and helps to reinforce the standing of smaller countries in the global context.

32. OPENNESS HAS BOUNDARY CONDITIONS AND CANNOT EXIST WITHOUT RULES (Belgrade, Sofia, Tallinn/Baltics)

Europe's scientific assets should be open and accessible to scientists and innovators across the Union. However, when openness builds on an asymmetric context, it can aggravate brain drain and a long-term decline of weaker national R&I systems.

To counteract this, balance openness with a local agenda, including links to cultural diversity and absorptive capacity. It is not about global or local; it is about a smart combination of both. Mechanisms to open up all R&I instruments are necessary to transition to full openness. To support strong hubs all over Europe, we must systemically support openly sharing knowledge and benefits across actors and countries, including through openness in partnerships.

33. THERE CANNOT BE OPENNESS WITHOUT SKILLED PEOPLE (Madrid, Tallinn/Baltics)

Research and innovation must be open to society and open to newcomers. Too often, the barriers of different mentalities, different goals and different languages prevent proper collaboration between scientists and broader society.

To achieve this, skills, capabilities and knowledge must be enhanced. That includes legal (IPR, licensing), digital (digital tools and services for collaboration) and communication (dialog with society) skills as well as personal attitudes towards openness. Since ethics and research integrity lie at the very foundations of Open Science, this should be aligned with the EU principles on Responsible Research & Innovation.

34. OPEN PATHWAYS BETWEEN SCIENCE, INDUSTRY AND SOCIETY (Athens, Copenhagen, Porto, Turin, Vienna)

There should be an ongoing flow of knowledge and people between universities, the public sector and firms in trans-European networks. We all potentially benefit when scientists found companies, when civil servants conduct research and when entrepreneurs enter public service. Today, career rewards and incentives often punish workers who move between worlds and thus hinder free flow of knowledge and experience. People should not have to choose between a secure income and retirement and a diverse career.

35. OPEN SCIENCE TO ACCELERATE THE SPREAD OF KNOWLEDGE (Athens, Madrid, Paris)

Excellent science must diffuse and turn into value. This is faster and broader if Open Science is applied: Open Data for science and Big Data for innovation. The European Research Council should lead the way on Open Access and Open Data.

36|41 SYSTEMIC SOLUTIONS

36. TAKE A SYSTEMIC APPROACH TO OPEN UP THE R&I SYSTEM AND REFORM INPUT AND OUTPUT (Berlin, Brussels, Madrid, Stockholm Tallinn/Baltics, Vienna)

In the face of 'wicked problems' presenting a hard to define challenge with unknown solutions – such as sustainability or migration – we rely on systemic innovation, including market, regulatory and organisational aspects. Taking a piecemeal approach addressing one aspect in isolation will not produce a solution to such wicked problems. They will require sustained, systemic action directed at transforming an entire economic or socio-technical system.

37. PUBLIC SECTOR INNOVATION IS NEEDED (Berlin, Brussels, Stockholm)

On the input side, public funding to R&I is scattered across a multitude of institutions without any clear rationale or coordination. On the outcome side, the state has to become more entrepreneurial. Organisations must reform to provide incentives to systemic thinking and action. Better design of national and EU institutions for synergies would increase the value created through research and innovation. Openness should replace linearity. Institutions must change. Universities must open up to embrace Open Innovation and Open Science.

38. SEE BEYOND SCIENCE AND TECHNOLOGY (Dublin, Porto, Sofia, Turin)

Knowledge is a dynamic concept. It includes science, but also design, cultural creativity and social innovation. We should invest in everything that creates value and not limit ourselves to economic value. We must shape our policy and instruments to reflect a broad understanding of innovation moving from research- and technology-centric innovation to include intangible knowledge and creativity, design innovation, user-driven innovation, social, organisational and institutional reforms.

39. BUILD LEADING FIRMS FROM LEADING TECHNOLOGIES AND CAPTURE THE VALUE IN EUROPE (Brussels, European Parliament, Paris, Porto, Stockholm)

Europe has been the cradle of leading technologies, such as graphene, but we have relatively few

patents and innovative firms exploiting these. Subsequently, the benefits accruing to Europe from such leading positions are limited, with stagnating productivity growth. Today, too many of Europe's fast-growing and high potential firms are bought by firms outside Europe.

Create value and jobs in Europe by deploying here the science and innovation developed here. Place particular emphasis on scaling-up worthy projects and supporting access to market, as this is fundamental for survival and growth. Enhance access to capital for high-growth potential companies and entrepreneurs. A European Innovation Council could serve as a foundation stone, supporting national initiatives.

40. APPLY TECHNOLOGIES TO CREATE LOCAL SOLUTIONS THAT CAN ACHIEVE EUROPEAN SCALE (Berlin, Brussels, Dublin, European Parliament, Paris, Porto, Stockholm)

Digitalisation opens up new opportunities for local and regional firms. Many opportunities for innovation and digitalisation exist in traditional sectors, such as agriculture, and they can be realised when the people who understand the challenges work with the people who can suggest solutions. EU level partnerships and instruments have to be opened up to small and medium sized countries and small and medium sized firms.

41. USE ALL THE RESOURCES IN THE SYSTEM (Athens, Porto, Warsaw)

Build a system to stimulate the optimal use of resources, be that human capital or physical infrastructure. Improve the attraction and retention of women and other underrepresented groups to research careers and empower them to succeed in both research and innovation. Diverse actors lead to stronger systems.

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RESEARCH & INNOVATION ECOSYSTEMS

42. CULTIVATE SUCCESSFUL ECOSYSTEMS (Copenhagen, Dublin, European Parliament, Helsinki, Madrid, Porto)

The strongest ecosystems link excellence in science, innovation and industrial competitiveness. Today, the mind-set of larger firms has changed and they actively invest in creating open innovation systems to capture value and market opportunities by creating spin-offs and collaborative partnerships with start-ups and scale-ups. All successful ecosystems need these 'system integrators'.

Thriving ecosystems flourish in a society based on equality and non-hierarchical structures, as in Finland, and can be supported by providing border-breaking spaces for creativity based on diversity, mixing cultures and ingenious people. This is how great achievements are born; forging strong connections between different actors with different roles and different backgrounds is the essence of open innovation.

43. CREATE PLAYGROUNDS FOR 'OPEN INNOVATION SCIENCE' (Berlin, Copenhagen, Helsinki)

Open science and open innovation must be better integrated. Promote and fund 'playgrounds': trust-based platforms where open science and open data are available to public and private actors striving for radical innovation. Successful platforms are systemic and cross-sectorial, linking traditional industry to digital.

When supported in public-private partnerships, these platforms can drive 'open test areas', experiments in radical innovation and market creation, such as the 'One Sea' initiative of automated shipping in the Baltic Sea. However, the current incentive systems at universities discourage such activities by rewarding only publications and patents, often tying up new ideas and data at an early stage.

44. CITIES HAVE LARGE DEMAND POTENTIAL (Copenhagen, Madrid, Porto, Stockholm, Warsaw)

Historically, Europe's growth was born in cities. Our cities have to re-emerge as vibrant and

tolerant innovation hubs, attracting creative people and venture capital. Cities should be included from the very start of the innovation process. Cities allow for living labs and demonstrators, revealing early on any practical or regulatory obstacles. Cities have potential for regulatory experimentation. Cities contend with the complexity of system governance and can embrace public sector innovation. Cities are also buyers. Policy should incentivise and enable cities to buy new innovative solutions. We need scale in joint public procurement of several EU cities.

45. LIVING LABS ARE NOT JUST FOR CITIES (Dublin)

Cities are important hubs in the innovation chain but solutions developed in cities will not always work in other contexts. Living labs and other R&I activities must also take place in rural areas and involve actors from rural areas. Missions could unlock absorptive capacity in less innovative regions, particularly using universities and other higher education institutions because of their ability to create networks within and between regions and countries. In this vision universities become central hubs in local-European ecosystems parsing frontier knowledge into regional solutions.

46. SCIENTIFIC EXCELLENCE AND INDUSTRIAL COMPETITIVENESS BUILD ON DIVERSITY (European Parliament, Paris, Stockholm)

It is time to open for a diversity of people, their experiences, needs, visions and perceptions of their society, environment and life. The 'people perspective' takes as a point of departure the citizen perspective, but includes a diversity of groups (local communities, SMEs, organisations, municipalities, NGOs etc.) and the diversity of their lived experiences, needs and visions. Including this complexity will feed the development of a high-tech knowledge society that is liveable for all.

47. ACADEMIC INSTITUTIONS ARE NOT THE ONLY CREATORS OF VALUE (Sofia)

Formalise and increase the support to new pockets of innovation happening outside of the classic

academic institutions in informal centres of knowledge like incubators and co-working spaces. To do this it is critically important to improve intellectual property rights policy and create a common Pan-European vehicle.

48. PUBLIC-PRIVATE-PEOPLE PARTNERSHIPS CAN COMBINE STRATEGY WITH OPENNESS (Berlin, Helsinki, Madrid)

Public-Private-People Partnerships can break historical industrial path dependency, allowing the economy to diversify and become more resilient. Already, in the US and Asia, government policy is closely linked with leading R&I performing companies. The EU could further foster open partnerships, based on a long-term commitment and a balanced contribution from all partners.

To involve interested partners, including end-users, universities, SMEs and research institutions, Public-Private-People Partnerships should make funds accessible through transparent processes and competitive calls. The identification, governance and functioning of those partnerships should be open, effective and efficient and implemented to allow full participation of the best European players. These partnerships must be open to new actors of innovation, cities and people.

49. 'IT TAKES 15 YEARS TO BECOME AN INNOVATOR' (Sofia, Tallinn/Baltics, Turin)

Innovation is 'messy' and it takes a long time to build innovation capacity, to learn how to speak with investors or to execute ideas. New innovative firms need a space to grow. Global companies can open up to smaller enterprises and link them to global markets and value chains or webs. For this, SMEs in the periphery have specific needs: they need time and dedicated support to connect them to the pan-European networks. There is a role here for the European Innovation Council in providing broader supports related to building skills and networks and increasing access to 'patient capital'.

50. UNIVERSITIES SHOULD BUILD AND SUPPORT STRONG ECOSYSTEMS (Athens, Copenhagen, Madrid)

Universities as platforms can play an important role in successful ecosystems. They can provide vital resources of knowledge and skilled human capital to communities and are potential wellsprings of innovation and economic development, not only for their home region but also in the EU as a whole. To meet targets of being a knowledge-based economy and to tackle societal challenges, Europe not only needs excellence in its universities but also relevance.

51. REIMAGINE ENTREPRENEURIAL UNIVERSITIES (Copenhagen, Porto)

These universities have to be practical, for example in Denmark and Sweden, there are Industry 4.0 Labs collaborating with robot manufacturers to train students for the new industry and encourage collaboration between researchers and firms. Institutional reforms are needed: build open platforms of collaboration ('Co-Labs') between industry and public research organisation, while reforming universities.

52. 'EUROPEAN UNIVERSITIES' FOR A STRONGER, MORE OPEN EUROPE (Athens, Brussels, Warsaw)

Despite the growing paradigm of openness many of our universities remain closed in their organisation. Closed between disciplines and closed to potential flows within the knowledge triangle; a full deployment of open science, open education, and open innovation at university level could break down these barriers. Universities can act to connect the local, regional and European levels acting as open platforms for cultural diversity and knowledge-based creativity.

To encourage institutions to address these barriers, on a voluntary basis, universities, big or small, could apply for a special statute as a 'European University' embodying the values, tradition and vision of knowledge production in Europe, stemming back to the Academy of Plato.

53. EUROPE HAS MORE TO WIN FROM NETWORKING THAN THE UNITED STATES

(Helsinki, Madrid, Tallinn, Warsaw)

Europe's cultural diversity is potentially a competitive advantage. Heterogeneous cultures in close geographical proximity provide excellent environments for testing and demonstration. However, to explore this public policy needs to unleash the power of networks and capture the value from diversity, from networking experiments of solutions in local, socio-culturally different ecosystems.

54|60

EXPERIMENTATION & REGULATION

54. EMBRACE UNCERTAINTY (European Parliament, Sofia, Stockholm)

Radical and systemic innovations are by nature disruptive and result in processes with a certain element of unpredictability. Therefore, we need a bottom-up, open and iterative approach, embracing experimentation. We need to create new tools for this. Demonstrators and experimentation are local but need a means to scale-up. This will require a different governance style, based on trust rather than control, allowing for a learning by doing approach, with budgetary and accountability incentives encouraging joint ventures across ministries and government departments.

55. CREATE LOCAL SPACES FOR EXPERIMENTATION (European Parliament, Copenhagen, Madrid, Stockholm, Turin)

EU R&I policy could be complemented by more flexibility at a local level, creating local spaces for experimentation, where people meet in Fab-Labs and where technologies and social innovation solutions are deployed in co-creation within local communities, business and industrial ecosystems. This includes co-creating innovative solutions in full-scale social laboratories, demonstrators and continuous learning processes. Policy development should open up to encourage local experimentation of innovative solutions by adopting a sandbox or similar approach.

56. EMBRACE EXPERIMENTATION AT THE EU LEVEL (Copenhagen, European Parliament)

In some aspects, the EU has more scope for experimentation than national administrations. The EU is more open to new ideas and to an experimental approach than national systems. Europe's future R&I policy must be experimental. We should accept more risks when allocating EU funding to R&I. Allocate a portion for 'out of the box' funding, to include new organisations, new instruments and the unknown. Explore alternative funding models.

57. GLOBAL REACH WITH LOCAL EXPERIMENTATION (Helsinki)

The vision of Finland is to be 'the most attractive and competent environment for experimentation and innovation'. Innovation-friendly regulation

and spaces for regulatory experimentation can be a global competitive advantage. It shortens time-to-market and give companies a first-mover advantage. These spaces can also attract global innovative firms. An illustration is the Finnish initiative of testing real-life innovative solutions for cities, as pilot solutions for world megacities.

58. PROCUREMENT MATTERS (Dublin, Madrid, Paris, Vienna)

Downstream capabilities need to be strengthened. Public procurement and pre-commercial procurement have a major role to play in accelerating the development, adoption and diffusion of innovation. A technical culture should be promoted among the public to push end-users to initiate and develop innovation.

59. MARKET CREATION NEEDS MORE THAN FUNDING (European Parliament, Stockholm, Vienna)

R&I must be combined with flexible and proactive regulatory frameworks to avoid lock-ins. Companies will invest where there is a market with the potential of scale. Market creation is progressive: it starts with innovation policy to build coalitions and niche innovations. Then follows action to remove regulatory barriers or provide regulatory stimulus. Public procurement of innovation can provide early buyers, while joint procurement can create scale. When 'the needle is shifting' and the current system 'cracks', then price and tax policies can play a role.

60. STABLE LEGISLATIVE FOUNDATIONS TO SUPPORT A FLEXIBLE, EXPERIMENTAL FRAMEWORK (European Parliament, Helsinki, Madrid)

A stable and clear regulatory framework across the Single Market will allow long-term competitiveness, corporate investments in R&I, pan-European Infrastructures and Important Projects of Common European Interest. This should be complemented by more regulatory flexibility at local level, or in a limited context, such as within regulatory sandboxes or fab-labs.

61|67

MISSIONS

61. MISSIONS AS TOOLS FOR MORE IMPACT AND SOFT COORDINATION (Copenhagen, Paris, Tallinn/Baltics, Turin)

Missions are a tool to orientate efforts of different actors and stakeholders towards common goals and thus better align different measures and activities.

Societal Challenges in Horizon 2020 have not achieved the necessary level of coordination nor the sense of purpose needed to have a transformative impact. If Missions are to be successful then improved coordination between EU and national levels and between different EU funding programmes and policy areas will be essential.

62. MISSIONS REQUIRE CONSTANT LEARNING (Berlin, Helsinki, Madrid, Stockholm)

Missions must ensure a constant learning process also for the policy process. Mission managers can send messages to the EU level and to national governments on any regulatory or administrative issues that could be addressed. This could be organised in a 'soft European semester'. This should not add to the many existing mechanisms and layers of reporting that exist, but rather complement and work in conjunction with them.

63. DEFINE THE 'OWNER' AND THE 'RISK TAKER' (Copenhagen, Stockholm, Tallinn/Baltics, Turin)

There are divergent views on who should set the agenda for Missions and who should carry the risk. Should it be those who have a stake in the missions, those who benefit from the Missions, or those who fund the Missions? Agenda setting means responsibility and accountability. For example, industry may want to contribute but perhaps not take on the full burden of responsibility for systemic risks. Put in place measures to prevent risk and share risk. An idea could be to create an insurance market to cover systemic risks.

64. CITIES CAN EMPOWER MISSIONS (Copenhagen, Helsinki, Porto)

Cities such as Copenhagen, Helsinki, Porto, Amsterdam or Barcelona or have gathered important experience in engaging local communities to set directions

for budgetary spending and project selection. This experience could inform the process of setting the agenda for the Missions to liaise top-down policies with bottom-up, citizens' driven needs and objectives.

65. MISSIONS NEED FRONTIER SCIENCE AND FRONTIER SCIENCE NEEDS MISSIONS (Helsinki, Stockholm, Tallinn/Baltics, Warsaw)

The iterative process towards a Mission needs frontier science all along, with industry cooperating with academia in open ecosystems. The energy transition needs new materials for energy storage, while quantum computing may challenge cyber security.

66. SOCIETAL MISSIONS REQUIRE MORE THAN SCIENCE, TECHNOLOGY AND INNOVATION (European Parliament, Turin, Vienna)

The task of defining and pursuing Mission goals cannot be the responsibility of R&I policy alone; the goals need to be defined in interaction with sectoral policies. This is not to say that sectoral policies should completely define the goals of R&I policy. Rather, there has to be a two-way street between the R&I domain and other related policy domains to both define the Mission. Further, an individual Mission will only achieve success and meaningful impact if collaboration between relevant policy domains and actors continues through the lifetime of the Mission.

67. MISSIONS SHOULD BE INCLUSIVE (Dublin, Tallinn/Baltics)

Missions should be inclusive and not just for 'closed clubs'. Citizens must be deeply involved in the entire Mission process as lead-users, co-creators and crowd-funders. Trust the leaders that people have chosen to help select the Missions, and trust citizens to co-design, possibly through deliberative democracy mechanisms, such as the Irish Citizens' Assembly. Policy makers should have validation from citizens and their representatives on whether the choices we are making will address a real societal problem.

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SYNERGIES

68. SYNERGIES ARE ABOUT MORE THAN FUNDING (European Parliament, Porto, Vienna)

Non-R&I policies from different domains can significantly affect R&I development and the effectiveness of R&I policies, sometimes more so than direct R&I policies. For example, climate concerns drive investment, citizens push for safer, cleaner transport, education and skills prepare the scientists of today and the workers of tomorrow, the Scandinavian welfare system is cited as providing the safety net that encourages innovators to make risky leaps.

Therefore, Horizon Europe will only be part of the solution. Align R&I policies with other sectoral and horizontal policies of the EU.

69. HORIZON EUROPE AND STRUCTURAL FUNDS ARE SEPARATE POLICIES BUT THE IMPLEMENTATION NEEDS SYNERGIES (Athens)

They are two different policies with different objectives. However, the potential for greater synergies in the implementation exists and should be better realised. Smart specialisation strategies have been successful in creating long-term visions and gathering regional actors in new platforms. However, existing firm structures, a lack of critical mass and weak networking across regions limit their success. Heavy bureaucracy, double audit requirements and contradicting rules for the exploitation of R&I outcomes are also barriers to greater synergies between the two instruments.

70. SHARED RESPONSIBILITY IS AN EUPHEMISM FOR DUPLICATION (Vienna)

The division of responsibilities between European, national and regional policy levels is counter-productive for a dynamic European research and innovation area. Shared responsibility leads to duplication of governance mechanisms, contradictory rationales and lack of synergies. We need a deep examination and revision of the principle of 'shared responsibility' that underpins much

of European policy-making and that hampers rather than strengthens innovation. The most obvious example is the burdensome and sometimes contradictory relationship between Structural Funds and Framework Programmes.

71. SOMETIMES 1+1+1 ADDS UP TO LESS THAN 3 (Brussels)

Belgium crystallises the complexity of the EU R&I system with three layers of R&I dynamics. An analysis of the synergies between regional and national R&I policies in Belgium hinted that 1+1+1 could add up to less than 3. To address these challenges, better synergies between the funding programmes at EU level could help. For smaller countries, specialisation is important, as well as a clear direction setting at the EU level, including synergies in the goals and rules of the Framework Programme and Structural Funds.

72. EU INSTRUMENTS SHOULD FOCUS ON ADDING VALUE TO NATIONAL INSTRUMENTS (Stockholm)

The EU can provide a real value added to national and regional funding efforts. First, by its size, the EU funding adds scale and leverage by setting the direction. Furthermore, the EU funding can broaden partnerships and the number of collaborative and competing actors in projects. It can bring diversity and scale to demonstrators and Living Labs; it can align innovations to EU regulation; it can ensure the size of public procurement; and it can scale-up local experiments to broader market creation by mobilising joint procurement and the Single Market.

73. EDUCATION AND LEARNING SUPPORT RESEARCH AND INNOVATION (European Parliament, Madrid)

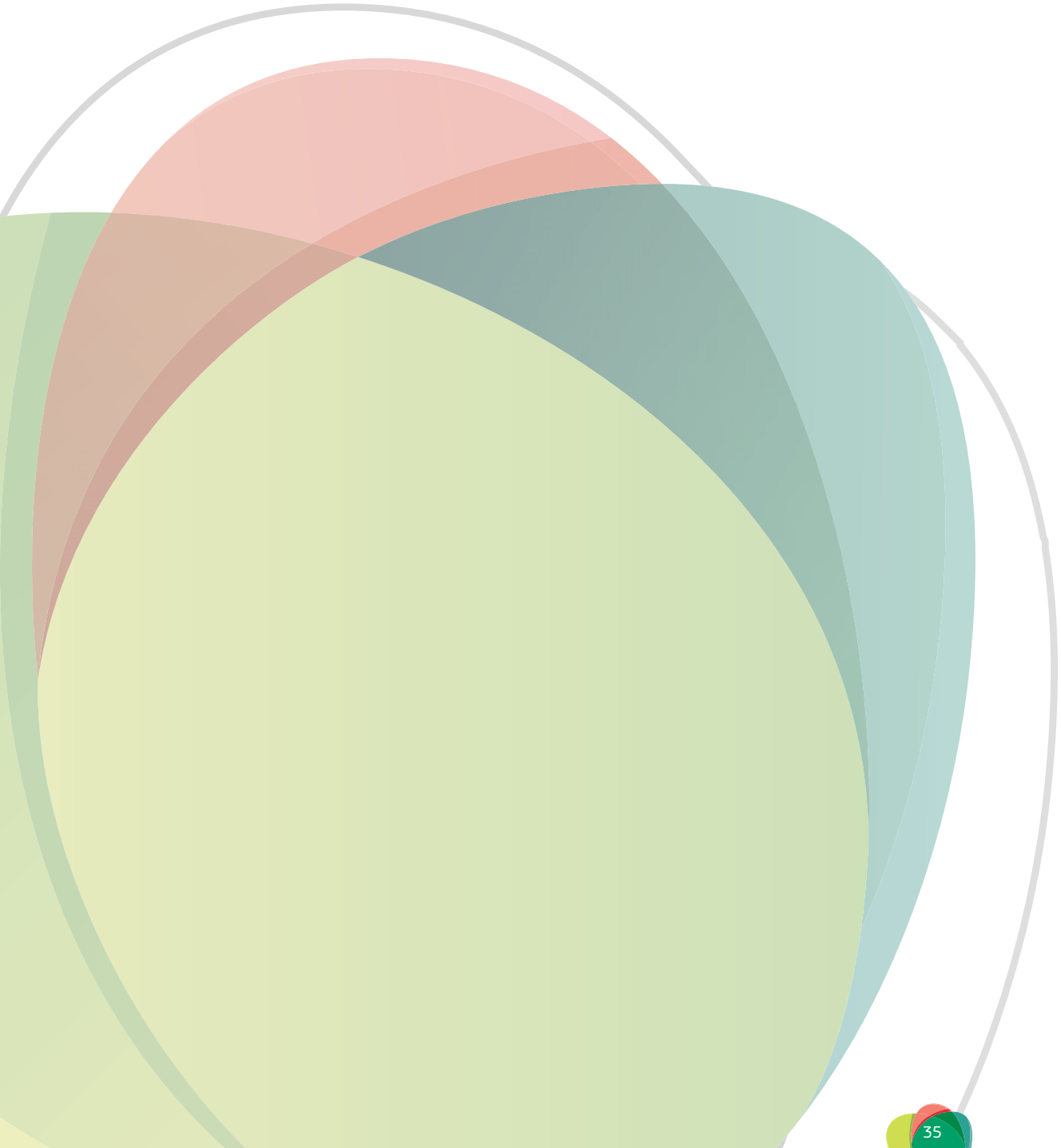
We have something very sought-after in Europe: creative people with knowledge and ideas. Innovation is a learning process. It implies an enormous effort on the part of all society to absorb. If we want to be successful and have a strong innovation and technological environment, we should first invest in people, then in institutions and only then in buildings. We should invest to build concentrations of knowledge and talent, attract smart people and become a destination for technological talents.

74. PREPARING FOR JOBS OF THE FUTURE (Helsinki, Madrid, Porto, Stockholm)

Synergies are not just about synergies in funding but also about coherence in policy initiatives. Jobs in the future will not be the same as today. In many areas, technologies will be game changers. We therefore need to take a systemic approach to integrate R&I, education, and employment policies. Train and attract people with the right skills. The ongoing and forthcoming structural changes in industry resulting from artificial intelligence and industry 4.0 must also make sense for the workers and employees. 'Do not leave people behind'.

75. BUILD THE EUROPEAN INFRASTRUCTURE OF TOMORROW (Paris, Warsaw)

In a system innovation approach, synergies are about not only R&I investment, transport and basic infrastructural investment are equally important. Addressing climate change will require smart roads, charging infrastructure that works across Europe and bicycle lanes in cities. Therefore, European infrastructure investment should enable the society and economy of tomorrow. Synergies with Structural Funds and pan-European infrastructures must be strengthened for systemic innovation of our society.



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IMPACT & DIFFUSION

76. THERE IS NO IMPACT WITHOUT DIFFUSION (Turin)

Radical innovations do not *ipso facto* create productivity gains or welfare gains. This only occurs when the innovations diffuse across society and the economy. Diffusion of R&I should be an integral part of R&I policy. Diffusion is also essential to bridge the innovation divide across European countries, which has increased over the last decade.

77. SET THE RIGHT CONDITIONS TO DIFFUSE KNOWLEDGE AND TECHNOLOGIES (Athens, Vienna, Tallinn/Baltics, Sofia)

Create the regulatory and financial framework conditions for universities to stimulate science-business collaboration. Modify State Aid rules to better allow synergies between regional and Horizon Europe funding. Understand the motivations of researchers and create different types of incentives: curiosity-, challenge- and entrepreneurial-incentives. In parallel, reinforce cooperation networks across Europe, where different countries and regions can bring their value added. Projects addressing societal challenges should be collaborative, strengthening cooperation across Europe.

78. MAXIMISE IMPACT THROUGH BETTER AND FASTER DIFFUSION (Paris, Stockholm)

Get new technology and innovation into society as quickly as possible. Learn from China, which combines a long-term perspective with faster impact and diffusion. Therefore, research to innovation must be complemented from the start with innovation to diffusion. We need different and better-integrated policies.

79. DON'T JUST INVEST FOR R&I: INVEST THROUGH R&I (Madrid)

When making investment decisions we should not pit investment in research and innovation against investment in sustainable agriculture, circular economy or tackling the migration crisis. We invest in critical challenges through R&I. R&I can be directed towards making sure that migrants do not die in the Mediterranean Sea or that we can feed ourselves without polluting the environment or the sea.

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INVESTMENT & FUNDING INSTRUMENTS

80. EUROPEAN FRAMEWORK PROGRAMMES MAKE A REAL DIFFERENCE (Brussels, Stockholm)

Horizon 2020 represents one quarter of competitive funding in Belgium. Other Member States report similar levels. This is a sufficiently large proportion to have significant traction. It shows that the overall size of the EU R&I budget is crucial for stimulating powerful dynamics in national R&I systems. The EU can add scale by setting direction, forming broad partnerships, stimulating diversity and scale in demonstrators and living labs. The EU can create a coherence between innovation and European legislation; give size to public procurement and scaling from local to market creation in the Single Market.

81. A LONG-TERM FINANCING FRAMEWORK TO TRANSFORM TO A KNOWLEDGE-INTENSIVE ECONOMY (Stockholm)

Despite increasing public R&I investment in the EU there has been no change in the industrial structure towards a more knowledge-intensive economy. In the current post-crisis period, we need more long-term policy thinking. The added value of EU investment lies in the potential to shape and structure market demand of sufficient scale to shift the economic structure of Europe. Clear policy signalling about priorities and a stable and clear regulatory framework across the Single Market will allow long-term competitive corporate investments in R&I and stimulate the change to a more knowledge-intensive economy.

82. CHANGE PARADIGM FROM GRANT FUNDING TO INVESTMENT (European Parliament, Madrid, Paris)

European R&I policy needs a paradigm shift from funding to investment. Research and innovation are an investment, not a subsidy. This investment should be directed towards both social and economic impacts in a balanced way. Research and innovation are at the very core of today's economy. They can create a better society and provide measurable improvements in the lives of Europe's citizens.

83. OPEN UP EU R&I INSTRUMENTS (Porto, Tallinn/Baltics, Warsaw)

EU R&I instruments are perceived by new actors as too closed. This is particularly the case for joint undertakings led by large firms. Why should European instruments shut out potential disruptors? Large and closed partnerships lead to concentration in space and depletion of talented persons from many regions in Europe. Share the benefits of EU R&I funding more broadly.

84. SMALLER GRANTS TO MORE ACTORS (Tallinn/Baltics, Warsaw)

The concentration of EU R&I funding to large and 'mega' projects and consortia has lowered the success rates and led to costly oversubscription. It forces projects to put more efforts on coordination than on research and innovation as such. Small countries and small players do not have the capability to take the lead in such projects. Actors further away from the technology frontier are increasingly discouraged to apply for EU funding. Without small project funding, it is difficult for young researchers to become established and they become discouraged from entering a research career leading to loss of research talent for the next generation.

85. LESS PRESCRIPTIVE FUNDING (Turin, Warsaw, Vienna)

Scientists should be able to develop their ideas, not forced to adapt to highly prescriptive calls or to geographic conditionality. The topics in Horizon 2020 are too narrowly predefined. It gives the impression of being the outcome of lobbying. Topics that are overly specific risk becoming uncompetitive. Earlier Framework Programmes had less prescriptive calls. Funding instruments should be designed to foster, not just enforce, the aspects of research ecosystems we want to see thrive, whether that be openness, multi-national collaboration, or cooperation between science and industry.

86. THE EU INVESTS AND THEN ABANDONS; SHOW MORE INTEREST IN THE PEOPLE YOU INVEST IN (Copenhagen, Warsaw)

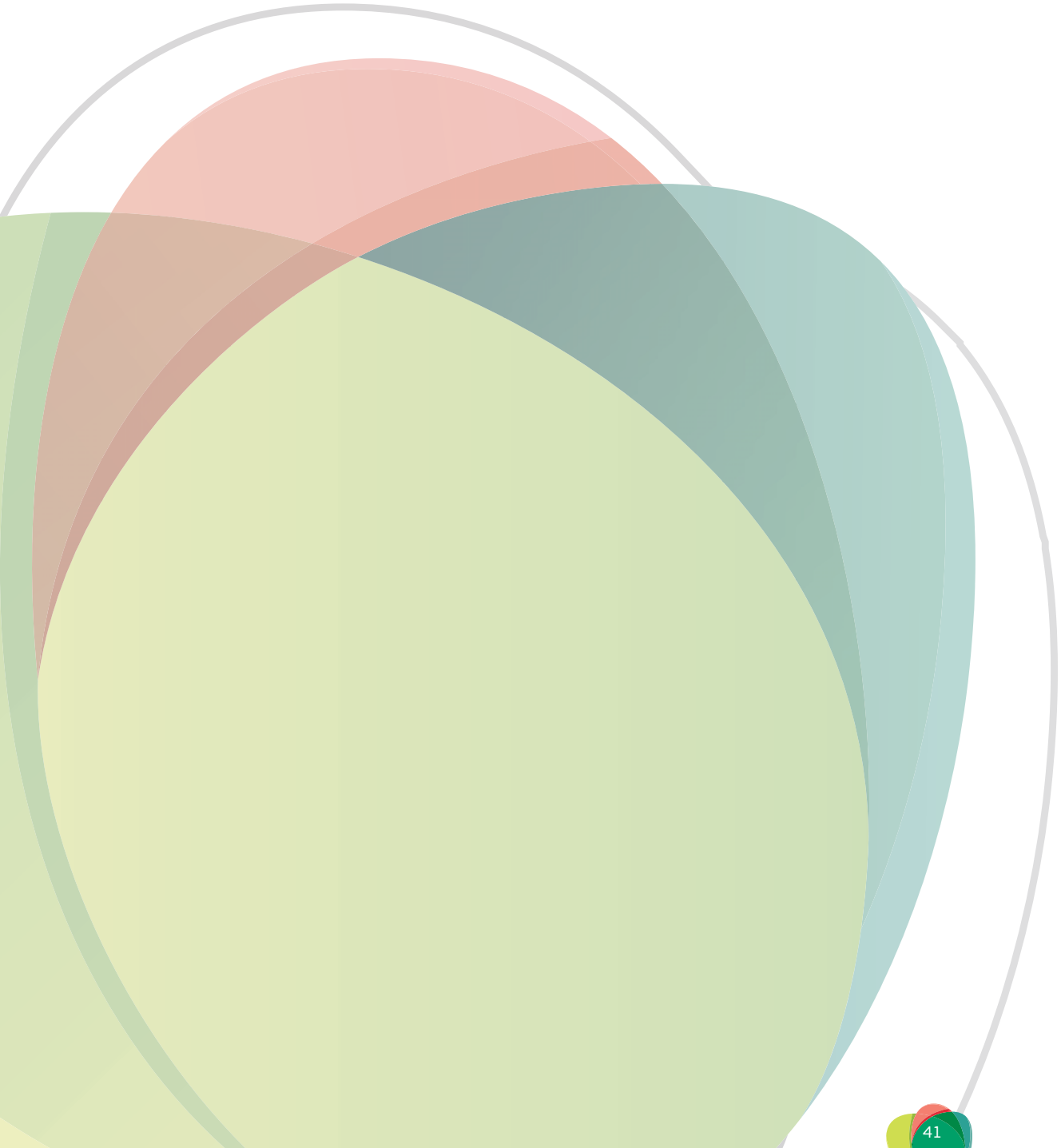
There is a lack of continuity in EU R&I funding. Projects, centres of excellence and infrastructure are set up, but then funding stops. We have to capitalise more on successful investments: evaluate what has been done and what can be changed.

87. FOCUS ON THE OUTCOMES OF PROJECTS (Brussels, Stockholm, Tallinn/Baltics)

R&I funders (e.g. EU, national agencies, private foundations) should engage more deeply in the individual projects they fund. Stop 'giving out money and closing your eyes'. Discuss with the scientists: what are the applications of your research? In some cases, direct institutional funding (linked to conditions) could be a more straightforward way to foster outcomes. At the same time, it should be possible to stop projects that are not delivering value.

88. MAKE HORIZON EUROPE FIT FOR TRANSFORMATIVE IMPACT (Madrid, Stockholm)

Horizon 2020 introduced societal challenges. However, the programme has not fully delivered on the transformative impact expected. This is because the EU formal proposal was designed within a research, development and investment policy and an European Research Area system building framework. What would the programme look like if it was framed as a long-term transformative R&I policy, capable of changing social systems and shifting to a circular economy?



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LEADERSHIP & GOVERNANCE

89. GOVERNANCE TO SET THE DIRECTION (Berlin, European Parliament, Paris)

The EU needs governance capacity to set the direction. The United States and China have governance structures that allow them to make decisions much more easily and swiftly, enabling them to gain market leadership and create new markets. The nature of European collaborative democracy means that decision-making processes will perhaps never be as swift as in other jurisdictions. Nevertheless, the potential to improve governance exists.

90. EUROPE IS NOT ONE COUNTRY (Belgrade, Dublin, Paris, Tallinn/Baltics)

The EU is not one single country, but is made up of many individual countries and regions with idiosyncratic R&I systems, embedded in local culture and history. Too often, the approach taken to research and innovation leads to fragmentation and beggar-thy-neighbour dynamics. We need regional instruments for R&I and we need better coordination between R&I instruments and regional instruments. They ensure measurable contributions to the competitiveness of European science and innovation. Europe needs to invest not only in the first layer of excellence but also in the second and third layer of excellence.

91. GO BEYOND ACCOUNTING TO STRATEGIC COORDINATION (Berlin)

Coordination between the national and EU-level does not have sufficient attention. We need to go beyond accounting ('Do we get enough?') to strategic coordination. This has implications for the European Semester but also for regions, where the current smart specialisation approach must be better integrated in an EU framework to avoid fragmentation. Any new strategic coordination must address the innovation divide and the diverse strengths of Member States.

92. SIZE MATTERS (Berlin, Dublin, Tallinn/Baltics)

There are many smaller countries in Europe and they have different needs and interests than

larger countries. While not deliberately, Framework Programmes sometimes favour larger countries as they have more big players with the experience to lead big projects, involving large industrial actors and more scope for large demonstrators. Small countries on the other hand, have a small pool of end-users and often do not have industry to involve in projects. If Europe continues to focus only on the winners, it will reinforce the large players. We have to support decentralised ecosystems based on 'pockets of excellence'.

93. LOCAL AND EUROPEAN (Tallinn/Baltics)

Researchers should not need to choose between focusing on local needs and focusing on excellence in global networks. Part of the results of the Framework Programme should 'remain' in the country and benefit local needs, through for example demonstrators and pilot projects. This would benefit also the Framework Programme, by building reputation and visibility. Engaging with the local level is one way to make European R&I apparent to citizens in their everyday lives.

94. THERE IS A REAL COST OF NON-EUROPE IN SCIENCE (Brussels, European Parliament, Paris, Warsaw)

Are we as good at research as we think we are? The EU as a whole invests more in R&I than the US, China, or Japan, and over the years we have invested billions in digital and other key enabling technologies. However, by some measures the EU has less world top science and fewer breakthroughs in leading technologies. Science and technology development suffers from fragmentation within the EU, hampering scale, while shooting in all directions. For science, the European Research Council could play a stronger harmonising role, e.g. some countries/regions have adopted the evaluation criteria of the ERC.

95. TOO MANY ACTOR GROUPS FEEL COMFORTABLE WITH THE CURRENT SITUATION (Copenhagen, Vienna)

The research system in Europe has not changed very much over the last 20 years. The European Research Council and the European Institute of Technology are the only new institutions. There is inertia due to many incumbent organisations and initiatives, which have not delivered the expected impact. Too many actor groups feel comfortable with the current situation of duplicated efforts and poor co-ordination, often married to a lack of transparency, because it protects their flow of resources. It offers opportunities to stay in the 'comfort zone' and avoid engaging with change and opening to other actors.

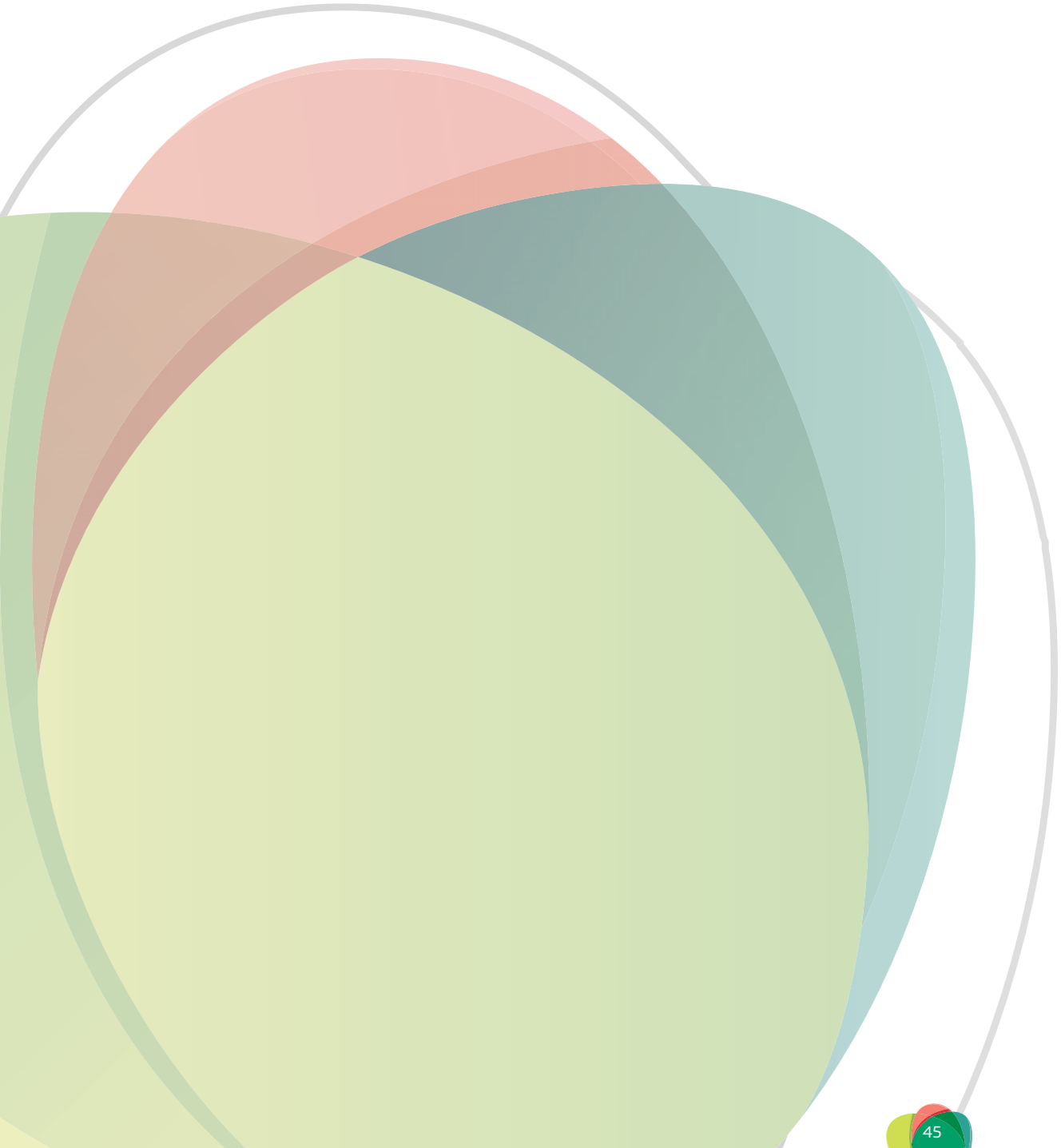
96. MANAGE RESISTANCE (Stockholm)

We need to take systemic resistance seriously, face it, and make it visible. We have to accept that some industries may disappear and others come up. We need a narrative that gives a positive role for the incumbents. R&I can help them change. If we wish to change a system, such as the mobility system or the energy system, we must first understand it: who are the actors, their interests, where are the innovative breaking points?

97. NO 'ONE-SIZE-FITS-ALL' FOR RESEARCH AND INNOVATION (Berlin, Dublin, Sofia, Turin, Vienna)

There is interesting and worthwhile innovation that is not science-based and there is worthwhile science that has no immediate innovative applications.

Social innovation, for example, is often not science based but leads to applications with a strong positive impact. Equally, there are scientific projects that could take decades to realise tangible benefits and we risk missing out if we do not have space for both in the R&I funding and policy landscape.



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MEASUREMENT & EVALUATION

98. CONTINUE TO SIMPLIFY PROGRAMMES AND PROJECT MANAGEMENT (Madrid, Sofia, Warsaw)

Focus European funding, and measure its outcomes based on results, not on the process. Abolish the reporting obligation for time sheets and focus the monitoring on the achievements of the project and its contribution to overall programme objectives. A more simple administration may also speed up the grant award process, which would make the programme more attractive for start-ups and innovative firms, for whom speed is crucial.

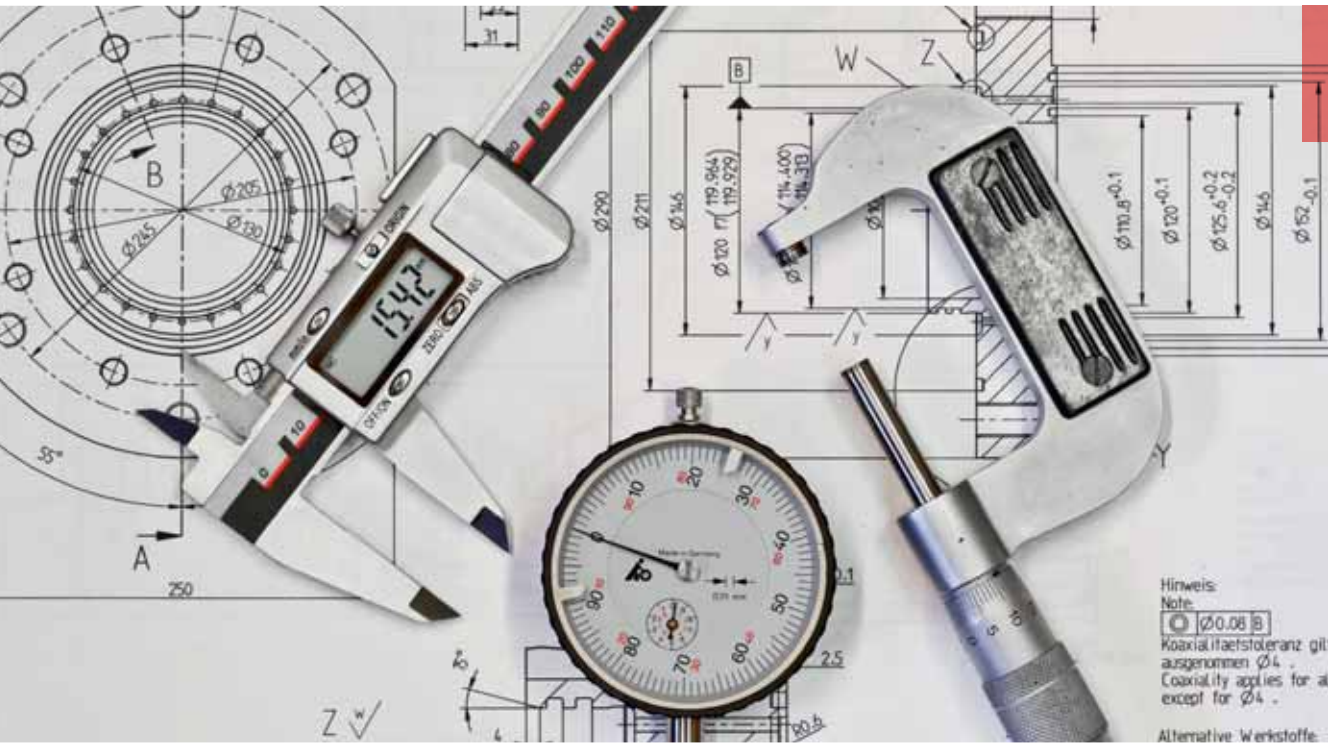
99. WE NEED BETTER WAYS TO MEASURE MEANINGFUL OUTCOMES (Brussels, Copenhagen, Porto, Tallinn/Baltics)

Our current policy is input-based, focusing on subsidies and instruments addressing market failures. We measure papers and patents but not impact and outcomes that are meaningful to people. Our current indicators can act as perverse incentives: GDP, university performance based on international publications, etc. lead us in the wrong direction. We should incentivise societal impact and Open Science by the measurement and reward system.

To achieve this, reverse our current approach, start instead with the outcome we want to achieve and then work backwards to design measurement and evaluation systems to track progress to the goals.

100. THE CURRENT MEASUREMENT OF SCIENCE LEADS TO OPPORTUNISTIC BEHAVIOUR (Sofia, Warsaw)

The way we measure scientific performance today does not incentivise researchers to pursue excellent



science. Instead, scientists rationally orient their behaviour to master the rules of the system. Trust building and a willingness to take risks and accept failures should replace excessive bureaucracy. Measurement of science performance should reward integrity. Go back to the peer-review system.

101. BUILD NEW EVALUATOR CAPACITY

(Dublin, Madrid, Stockholm)

Transparent, public and regular evaluation and monitoring is part of an iterative process. Calls and topic areas are increasingly interdisciplinary and target a range of policy goals. We often have a shortage of evaluators and sometimes they are locked into a narrow disciplinary bias. Evaluation panels must understand frontier knowledge and system transition. Evaluators and assessors can only perform as well as the training and support they are given. New initiatives such as Missions and the European Innovation Council need new evaluator profiles. Create a broader community of evaluators. Develop training to support them in tandem with the development of new instruments and calls.

ACKNOWLEDGEMENTS

The 101 ideas contained here are born of the expertise, engagement and enthusiasm of the many people who we met as we undertook the *Tour d'Europe*[5] in the course of 2017 and 2018. These people gave freely of their time and expertise, demonstrating a deep interest in and commitment to the future of the European project and we hope that the collection of ideas in this publication does justice to their perspectives. A full list of participating organisations is provided in the annex[6] and a full list of participating persons from each Member State can be found on the *Tour d'Europe* webpage.

The Tour started in the European Parliament in June 2017, and continued to Paris in September 2017, and after subsequent visits to Stockholm, Madrid, Berlin, Helsinki, Vienna, Turin, Sofia, Athens, Porto, Tallinn (covering not just Estonia, but also Latvia and Lithuania), Warsaw, Brussels, Copenhagen and Belgrade, ended in Dublin in August 2018.

The *Tour d'Europe* took the form of a dialogue with independent Think Tanks and policy advisors in EU Member States, and beyond. Each of the selected Think Tanks represented a platform recognised but not necessarily directly connected to the national administration of the country visited. The main interlocutors were policy advisers, researchers, business innovators, designers, practitioners and other experts, invited by the hosting Think Tanks. National authorities, as well as the European Commission, followed the debate and supported the organisation of the *Tour d'Europe* from the very beginning of each encounter.

Various members, past and present, of the Research, Innovation and Science Experts (RISE) group of advisors to Commissioner Carlos Moedas, reinforced by economic expertise from the Economic and Social Impact of Research (ESIR) group of experts headed the delegation of European experts. Other experts, with relevant expertise, reinforced the delegation at specific meetings. We are grateful to them all for their active participation and thoughtful contribution.

The *Tour d'Europe* would not have been possible without the hard work and dedication of numerous people working in various organisations across Europe. We are deeply grateful to you all for your contribution.

Finally, we thank Commissioner Moedas for entrusting us as advisors on the future of European R&I policy and the inspiration of openness provided by his paradigm shifting 3 'O's strategy.

LUC SOETE
Co-ordinator of the Tour d'Europe

DARIA TATAJ
Chair of RISE Group

[5] https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/support-eu-research-and-innovation-policy-making/rise-group/research-and-innovation-in-europe_en

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ANNEX: TOUR D'EUROPE HOSTS

KICK-OFF EUROPEAN PARLIAMENT EVENT
Knowledge4Innovation
www.knowledge4innovation.eu

PARIS
France Stratégie
www.strategie.gouv.fr

STOCKHOLM
Vinnova www.vinnova.se

MADRID
COTEC www.cotec.es

BERLIN
Expertenkommission Forschung und Innovation
www.e-fi.de
Leopoldina
www.leopoldina.org
ACATECH www.acatech.de

HELSINKI
Business Finland
www.businessfinland.fi

VIENNA
AIT www.ait.ac.at
FFG www.ffg.at

TURIN
Compagnia di San Paolo
www.compagniadisanpaolo.it

SOFIA
Move.BG www.move.bg

ATHENS
ELIAMEP www.eliamep.gr

PORTO
INESCTEC
www.inesctec.pt

TALLINN (covering Estonia, Latvia and Lithuania)
Estonian Ministry of Education and Research
www.hm.ee
Estonian Research Council
www.etag.ee
Lithuanian Research Council
www.lmt.lt
Latvian Science Council
www.lzp.gov.lv

WARSAW
Polish Academy of Sciences
www.rzym.pan.pl

BRUSSELS
CIS CFS www.belspo.be

COPENHAGEN
CBS www.cbs.dk
DEA www.dea.nu

BELGRADE
Institute of Physics, Belgrade
www.ipb.ac.rs

DUBLIN
Department of Business, Enterprise and Innovation
www.dbei.gov.ie
Enterprise Ireland
www.enterprise-ireland.com
Science Foundation Ireland
www.sfi.ie

ANNEX 2: TOUR D'EUROPE DISCUSSION TOPICS

EUROPEAN PARLIAMENT | 27 June 2017
1. EU's future R&I policy – Visions and values
2. An Innovation-driven EU policy – which framework conditions and instruments?
3. Focus on Impact - Creating social and economic value

PARIS | 7 September 2017
1. Europe's Future R&I Policy – visions and values
2. Towards a Mission-oriented R&I Policy
3. Europe's R&I Excellence and Impact

STOCKHOLM | 12 September 2017
1. Europe's Future R&I Policy – visions and values for openness
2. From the Lund Declaration to a focus on impact
3. System innovation – create and capture value

MADRID | 6 October 2017
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Circular Economy – Create and Capture Value

BERLIN | 14 & 15 November 2017
1. Europe's Future R&I Policy – visions and values for openness
2. Focus on impact and engaging citizens
3. Relationship between national and EU R&I Policies and Actions

HELSINKI | 28 & 29 November 2017
1. R&I in Europe's Future: Visions and values for openness
2. New EU R&I policy for impact and citizens
3. European Innovation Council
4. Partnering for innovation ecosystems in the platform economy

VIENNA | 15 & 16 January 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Role of KETs for addressing societal challenges
3. Focussing on impact and citizens' engagement

TURIN | 25 January 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Europe's research policy at the crossroads between technological and social innovation

SOFIA | 29 January 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Accelerating transfer of knowledge from science to business

ATHENS | 12 February 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. R&I and cohesion

PORTO | 16 February 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Partnerships for Innovation and risk sharing towards job creation: the case of collaborative laboratories across Europe

TALLINN (covering Estonia, Latvia and Lithuania) | **6 March 2018**
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Missions and the Digital

WARSAW | 20 March 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Basic and applied – different approaches to organising funding and research

BRUSSELS | 22 March 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Coherence between regional, national and EU R&I policies and initiatives

COPENHAGEN | 11 June 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Open Innovation in Science

BELGRADE | 3 July 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. Innovation Instruments for Accession Countries: Social Relevance and Narrowing Development Gaps

DUBLIN | 29 & 30 August 2018
1. Europe's Future R&I Policy – visions and values for openness
2. Focussing on impact and engaging citizens
3. EIC and Innovation Ecosystems

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The Research, Innovation and Science Expert (RISE) Group published a report on Europe's Future: Open Innovation, Open Science and Open to the World in May 2017. Building on this work, the RISE and ESIR expert groups met with independent think tanks in the field of research and innovation from EU Member States and beyond over the course of 2017 and 2018.

This document contains a collection of the creative ideas that emerged from these discussions. Taken together they provide a panoply of thoughts and ideas on the future of EU policy in research and innovation that reflects the diversity of national perspectives and history of research and innovation in each of the participating countries.

Research and Innovation policy